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2007 WATERFOWL HARVEST SURVEY

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ABSTRACT

A sample of waterfowl hunters was contacted after the 2007 hunting seasons to estimate hunting activity and determine opinions and satisfaction with hunting regulations. Waterfowl hunting license sales declined nearly 3% between 2006 and 2007, but the estimated number of people hunting ducks declined 7%. The number of people hunting geese was not significantly different between 2006 and 2007. In 2007, about 47,700 people hunted waterfowl in Michigan (nearly 39,300 duck hunters and 34,400 goose hunters). Satisfaction with waterfowl numbers, hunting experience, and hunting regulations among duck and goose hunters was similar between 2006 and 2007.

INTRODUCTION

The Michigan Natural Resources Commission and Department of Natural Resources (DNR) have authority and responsibility to protect and manage wildlife resources in the state of Michigan. This responsibility is shared with the U.S. Fish and Wildlife Service (USFWS) and other state and provincial wildlife management agencies for the management of migratory birds such as ducks (*Anatinae*) and geese (*Branta* and *Anser* spp.). Harvest surveys are one of the management tools used by the Wildlife Division in developing regulations. Estimating harvest and hunting effort are among the primary objectives of these surveys. Estimates derived from harvest surveys, as well as breeding bird abundance and population models, are used to develop harvest regulations that provide sustainable recreational hunting and viewing opportunities of migratory game birds. Wildlife management agencies also consider hunter opinions and desires when establishing regulations.

Waterfowl could be harvested during hunting seasons that occurred September 1, 2007, through February 3, 2008, (Table 1) by a person possessing both a waterfowl and a small



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game hunting license (includes resident, nonresident, 3-day nonresident, resident junior, and senior small game hunting licenses). Waterfowl hunters also had to obtain a federal waterfowl stamp and register with the National Migratory Bird Harvest Information Program (HIP). Hunters younger than 16 years of age could hunt waterfowl without a waterfowl hunting license or a federal waterfowl stamp; however, they still were required to purchase a small game license and register with the HIP.

The HIP is a cooperative effort between state wildlife agencies and the USFWS. It was implemented to improve knowledge about harvest of migratory game birds (e.g., ducks, geese, and woodcock [*Scolopax minor*]). Beginning in 1995, any person who hunted migratory game birds in Michigan was required to register with the HIP and answer several questions about their hunting experience during the previous year. The HIP provided the USFWS with a national registry of migratory bird hunters from which they can select participants for Federal harvest surveys.

State wildlife agencies select specific regulations, such as hunting season dates, within overall frameworks (e.g., number of days of hunting and bag limits) set by the USFWS. Both waterfowl population status and hunter attitudes are used when developing Michigan waterfowl hunting regulations. Although estimating harvest, hunter numbers, and hunting effort were the primary objectives of the waterfowl harvest survey, this survey also provided an opportunity to collect information about management issues. Questions were added to the questionnaire to estimate hunters' opinions and satisfaction with hunting regulations and waterfowl numbers.

METHODS

The Wildlife Division provided all waterfowl hunters the option to report information voluntarily about their hunting activity via the internet. This option was advertised on the DNR Web site and an e-mail message was sent to waterfowl hunting license buyers that had provided an email address to the DNR (12,883 licensees). Hunters reported whether they hunted, locations hunted (county and management zone), type of land on which hunt occurred (public or private lands), number of days spent afield, and number of waterfowl harvested. Hunters were also asked to rate their overall hunting experience and indicate satisfaction with hunting regulations (season dates and bag limits). Following the 2007 hunting seasons, a questionnaire was sent to 5,977 randomly selected people who were eligible to hunt waterfowl and had not already voluntarily reported harvest information via the internet. Hunters receiving the questionnaire in the mail were asked the same questions as hunters responding on the internet.

Estimates were calculated using a stratified random sampling design (Cochran 1977). Using stratification, hunters were placed into similar groups (strata) based on their age, licenses purchased, whether they had registered with the HIP, and whether they had voluntarily reported their hunting activity on the internet. The first stratum consisted of people at least 16 years old that had purchased a waterfowl hunting license. The second stratum consisted of people less than 16 years old that had registered with the HIP. The third stratum consisted of hunters that had voluntarily reported their waterfowl hunting activity on the internet before the sample for the mail survey was selected. The overall sample consisted of 4,736 people from

the first stratum (N=58,530), 1,241 people from the second stratum (N=15,258), and 259 from the third stratum (N=259). Estimates were derived for each group separately. The statewide estimate was then derived by combining group estimates so the influence of each group matched the proportion its members occurred in the statewide population of hunters. The primary reason for using a stratified sampling design was to produce more precise estimates. Improved precision means similar estimates should be obtained if this survey were to be repeated.

Estimates were derived separately for the Upper Peninsula (UP), northern Lower Peninsula (NLP), and southern Lower Peninsula (SLP, Figure 1). These areas are consistent with areas used for estimation in previous years, although they do not match formal management zones. Estimates were also calculated separately for duck and goose management zones. Hunting effort and birds harvested from unknown locations were allocated among areas in proportion to the known effort and harvest. Estimates were calculated along with their 95% confidence limit (CL). In theory, this confidence limit can be added and subtracted from the estimate to calculate the 95% confidence interval. The confidence interval is a measure of the precision associated with the estimate and implies the true value would be within this interval 95 times out of 100. Unfortunately, there are several other possible sources of error in surveys that are probably more serious than theoretical calculations of sampling error. They include failure of participants to provide answers (nonresponse bias), question wording, and question order. It is difficult to measure these biases. Thus, estimates were not adjusted for possible bias.

Statistical tests are used routinely to determine the likelihood that differences among estimates are larger than expected by chance alone. The overlap of 95% confidence intervals was used to determine whether estimates differed. Non-overlapping 95% confidence intervals was equivalent to stating the difference between the means was larger than would be expected 995 out of 1,000 times ($P < 0.005$), if the study had been repeated (Payton et al. 2003).

Questionnaires were mailed initially in mid-March. Up to two follow-up questionnaires were sent to non-respondents. Questionnaires were undeliverable to 125 people, primarily because of changes in residence. Questionnaires were returned by 3,541 people, yielding a 61% adjusted response rate. In addition, 259 people voluntarily reported information about their hunting activity via the internet before the random sample was selected.

RESULTS

License sales and hunter participation

In 2007, 58,863 people purchased a state waterfowl hunting license (Table 2). The average age of people that purchased a waterfowl hunting license was 42 years (Figure 2). About 2% (877) of waterfowl license buyers were younger than 17 years old. Hunters 10-15 years of age could legally hunt waterfowl without a waterfowl hunting license; thus, the count of youth license buyers failed to count all youth waterfowl hunters. About 98% of the waterfowl hunting license buyers were males.

An estimated 47,748 people went afield to hunt waterfowl in 2007 (Table 3). The mean age of the active waterfowl hunter was 40 years, and about 11% of the active hunters were less than 17 years old (5,331 youth hunters). About $64 \pm 1\%$ of the people eligible to hunt waterfowl spent time hunting ducks or geese. About $72 \pm 1\%$ of the people that had purchased a waterfowl hunting license (stratum 1) hunted waterfowl. In contrast, $35 \pm 2\%$ of the people less than 16 years old that had registered with the HIP (stratum 2) hunted waterfowl. An estimated 39,299 duck hunters spent 309,699 days afield; while an estimated 34,445 goose hunters spent 263,595 days afield (Tables 4 and 5). About $35 \pm 1\%$ ($25,996 \pm 1,108$) of those eligible to hunt waterfowl attempted hunting both ducks and geese.

Harvest and hunting trends

The number of active duck hunters statewide (all seasons combined) declined 7% between 2006 and 2007 (Table 4). Although hunting effort by duck hunters and their harvest also declined statewide, these latter declines generally were not statistically different between the 2006 and 2007 hunting seasons (Tables 5-9). The number of goose hunters, their hunting effort, and harvest did not change significantly statewide (all seasons combined) between 2006 and 2007. However, hunting effort and goose harvest increased significantly in the UP despite five fewer days available for hunting in 2007, compared to 2006 (Tables 5-6).

Hunter opinions

An estimated 57% of the Michigan duck hunters were satisfied with their duck hunting experience in 2007, 21% had a neutral opinion about their experience, while 20% of duck hunters were dissatisfied (Table 10). Satisfaction among goose hunters with their goose hunting experience was similar to the satisfaction levels reported for duck hunting.

Nearly 50% of Michigan duck hunters were satisfied with the 2007 duck hunting season dates, length of the duck season, and the daily duck limit (Table 10). About 46% of the duck hunters reported they were satisfied with the number of ducks seen in 2007, but only 30% of duck hunters were satisfied with the number of ducks harvested. Similarly, about 61% of goose hunters were satisfied with the number of geese seen in 2007, but only 36% of goose hunters were satisfied with the number of geese harvested.

DISCUSSION

Since 1954, the highest numbers of duck and goose hunters recorded in Michigan occurred in 1970 (Figure 3). From this peak, the current number of people hunting ducks has declined 72% (average annual decline = 3.3%), while the number of people hunting geese has declined 47% (average annual decline = 1.7%). Declining numbers of small game hunters, including waterfowl hunters, has been noted previously in Michigan and throughout the United States since the mid-1970s (Enck et al. 2000, U.S. Department of the Interior 2002, Aiken 2004, Frawley 2006). Between 2001 and 2006, the number of hunters pursuing migratory birds declined 22% nationally (U.S. Department of the Interior 2007). Similarly, the number of people hunting ducks in the regular duck hunting season (first season split) declined an estimated 27% in Michigan during this same period (Figure 3). Many factors are responsible for declining waterfowl hunter numbers including increased urbanization of the

human population, increased competition between hunting and other leisure activities, decreased access to private land for hunting, and loss of waterfowl habitat. Although the number of duck hunters and duck harvest has decreased since 1970, duck harvest per day of hunting effort has increased (Figure 4). Goose harvest and the mean number of geese taken per day of hunting effort also have increased gradually since the 1970s (Figure 4).

The proportion of duck hunters satisfied with their overall duck hunting experience was the same in both 2006 and 2007 (57% satisfied both years, Table 10). Moreover, similar proportions of duck hunters were satisfied with the number of ducks seen, ducks harvested, and hunting season dates in both 2006 and 2007. Goose hunters also reported similar levels of satisfaction with their overall goose hunting experience in 2006 and 2007 (55% versus 54%, Table 10). Furthermore, goose hunters in 2006 and 2007 reported similar levels of satisfaction with the number of geese seen and geese harvested.

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Table 1. Waterfowl hunting seasons in Michigan, 2007-2008.

Species, season, and area ^a	Season dates
Ducks ^b	
North Zone (UP)	Sept. 29 – Nov. 27
Middle Zone	Sept. 29 – Nov. 25 and Dec. 1 – 2
South Zone	Oct. 6 – Dec. 2 and Jan. 5 – 6
Canada geese ^{b,c}	
Early seasons	
Upper Peninsula	Sept. 1 – 10
Lower Peninsula	Sept. 1 – 15
Regular seasons	
UP Mississippi Valley Population Unit	Sept. 18 – Nov. 1
LP Mississippi Valley Population Unit	Oct. 6 – Nov. 12 and Nov. 22 – 28
LP Southern James Bay Population Unit	Oct. 6 – 14 and Nov. 22 – Dec. 12
Late season	
Southern Lower Peninsula	Jan. 5 – Feb. 3

^aSee Figure 1 for boundaries of hunt areas.

^bDucks and geese could also be taken during a special 2-day Youth Season (September 15-16).

^cSpecial goose hunting seasons also occurred on Goose Management Units, but these seasons affected a relatively small area.

Table 2. Number of waterfowl hunting licenses sold in Michigan, 2003-2007.

Item	Year					2006-2007 % Change
	2003	2004	2005	2006	2007	
Number of licenses sold ^a	65,457	63,320	60,234	60,994	59,475	-2.5
Number of people buying a hunting license ^{b,c}	65,024	62,738	59,658	60,401	58,863	-2.5

^aThe number of licenses sold is higher than the number of people buying licenses because some people purchased multiple licenses.

^bA person was counted only once, regardless of how many licenses they purchased.

^cHunters 10-15 years of age could legally hunt waterfowl without a waterfowl hunting license.

Table 3. Estimated number, sex, and age of active waterfowl hunters, and proportion and number of youth waterfowl hunters in Michigan, 2003-2007.^a

Hunters	2003	2004	2005	2006	2007	
					Estimate	95% CL
Waterfowl ^b	60,805	58,422	50,431	50,230	47,748*	1,085
Males (%)	97.5	98.2	97.2	97.1	95.7	0.8
Females (%)	2.5	1.8	2.8	2.9	3.9	0.8
Age (Years)	39.7	39.6	40.4	40.4	40.2	0.6
Youth (%) ^c	9.7	NA ^d	10.7	10.9	11.2	1.1
Youth (No.) ^c	5,922	NA	5,389	5,471	5,331	573

^aAnalyses included only those people that hunted.

^bPeople that hunted ducks or geese (active hunters).

^cHunters 10-16 years of age.

^dNot available.

*Non-overlapping 95% confidence intervals indicated estimates differed significantly between 2006 and 2007 (P<0.005).

Table 4. Estimated number of waterfowl hunters by season and region in Michigan, 2004-2007.^a

Species and area (stratum)	2004	2005	2006	2007		2006-2007 % Change
				No.	95% CL	
Ducks (First split)						
UP	7,987	6,654	5,555	5,698	614	3
NLP	19,788	16,218	18,351	16,319	963	-11*
SLP	27,831	22,704	22,761	21,073	1,046	-7
Statewide	48,881	40,525	41,102	38,142	1,153	-7*
Ducks (Second split)						
UP						
NLP	1,652	6,399	2,838	1,855	364	-35*
SLP	8,011	9,628	9,147	7,844	712	-14
Statewide	9,618	15,421	11,886	9,514	782	-20*
Ducks (Seasons combined)						
UP	8,142	6,696	5,578	5,703	614	2
NLP	20,364	17,883	18,634	16,689	970	-10
SLP	29,494	24,218	23,915	22,331	1,065	-7
Statewide	50,330	42,660	42,068	39,299	1,151	-7*
Geese (Early season)						
UP	2,484	2,013	1,663	2,120	385	27
NLP	7,865	7,875	8,015	6,771	671	-16
SLP	15,844	13,603	13,800	12,801	876	-7
Statewide	25,216	22,944	22,747	21,093	1,054	-7
Geese (Regular season)						
UP	4,019	3,643	3,075	3,659	501	19
NLP	9,694	9,448	10,022	9,388	770	-6
SLP	16,246	13,223	15,015	13,637	893	-9
Statewide	28,815	25,207	26,934	25,650	1,099	-5
Geese (Late season)						
UP						
NLP	605	1,057	950	569	202	-40
SLP	8,141	8,313	9,813	7,597	700	-23*
Statewide	8,687	9,192	10,723	8,166	731	-24*
Geese (Seasons combined)						
UP	5,255	4,334	3,611	4,415	545	22
NLP	13,357	12,809	13,456	11,738	846	-13
SLP	25,235	20,395	22,210	20,835	1,036	-6
Statewide	40,394	34,726	36,570	34,445	1,147	-6

^aThe number of hunters does not add up to the statewide total because hunters can hunt in more than one region. Regions did not match hunting zones; see Tables 7 and 9 for estimates by hunting zones.

*Non-overlapping 95% confidence intervals indicated estimates differed significantly between 2006 and 2007 ($P < 0.005$).

Table 5. Estimated amount of waterfowl hunter effort (days afield) by season and region, 2004-2007.^a

Species and area	2004	2005	2006	2007		2006-2007 % Change
				No.	95% CL	
Ducks (First split)						
UP	50,977	46,678	32,366	37,279	5,955	15
NLP	140,167	84,778	122,187	105,988	10,081	-13
SLP	198,688	161,176	167,286	151,414	12,231	-9
Statewide	389,831	292,632	321,838	294,681	16,055	-8
Ducks (Second split)						
UP						
NLP	2,591	30,417	5,841	3,129	748	-46*
SLP	12,577	16,693	18,459	11,888	1,188	-36*
Statewide	15,167	47,110	24,299	15,018	1,409	-38
Ducks (Seasons combined)						
UP	51,001	46,809	32,951	37,279	5,955	13
NLP	142,793	114,904	128,839	109,117	10,286	-15
SLP	211,204	178,029	184,347	163,302	12,791	-11
Statewide	404,998	339,741	346,137	309,699	16,548	-11
Geese (Early season)						
UP	9,014	6,548	5,471	7,988	1,884	46
NLP	31,670	30,532	31,725	29,809	3,792	-6
SLP	63,975	55,699	54,256	50,956	4,621	-6
Statewide	104,659	92,779	91,453	88,753	6,129	-3
Geese (Regular season)						
UP	21,899	21,676	16,676	27,795	5,728	67*
NLP	48,667	45,223	55,009	49,547	5,987	-10
SLP	72,173	59,751	75,221	66,334	6,608	-12
Statewide	142,739	126,650	146,907	143,677	10,272	-2
Geese (Late season)						
UP						
NLP	2,975	3,012	3,304	1,894	1,003	-43
SLP	31,215	33,497	38,544	29,271	3,857	-24*
Statewide	34,190	36,509	41,847	31,166	4,194	-26*
Geese (Seasons combined)						
UP	30,726	28,187	22,169	35,890	7,055	62*
NLP	83,132	78,818	90,171	81,457	9,061	-10
SLP	167,731	148,934	167,866	146,248	11,929	-13
Statewide	281,588	255,938	280,207	263,595	16,041	-6

^aRegions did not match hunting zones; see Tables 7 and 9 for estimates by hunting zones.

*Non-overlapping 95% confidence intervals indicated estimates differed significantly between 2006 and 2007 (P<0.005).

Table 6. Estimated waterfowl harvest by season and region in Michigan, 2004-2007.^a

Species and area	2004	2005	2006	2007		2006- 2007 % Change
				No.	95% CL	
Ducks (First split)						
UP	44,098	40,274	38,194	46,586	9,971	22
NLP	137,856	109,941	168,993	140,932	17,390	-17
SLP	190,955	178,186	183,215	162,350	18,061	-11
Statewide	372,908	328,401	390,401	349,868	26,955	-10
Ducks (Second split)						
UP						
NLP	3,415	30,569	7,978	4,686	1,680	-41
SLP	19,121	25,848	22,491	19,508	2,862	-13
Statewide	22,536	56,417	30,468	24,195	3,302	-21
Ducks (Seasons combined)						
UP	44,182	40,321	38,425	46,591	9,971	21
NLP	141,426	140,431	177,375	145,626	17,867	-18
SLP	209,837	204,067	205,069	181,846	19,373	-11
Statewide	395,444	384,819	420,869	374,062	28,171	-11
Geese (Early season)						
UP	6,347	4,817	3,426	7,879	2,533	130*
NLP	23,587	32,138	30,707	26,402	4,765	-14
SLP	57,237	54,435	52,539	46,499	5,894	-11
Statewide	87,171	91,390	86,672	80,780	8,071	-7
Geese (Regular season)						
UP	9,264	10,178	7,336	16,408	4,052	124*
NLP	21,950	27,524	32,717	25,636	4,108	-22
SLP	35,710	40,177	40,830	39,667	5,611	-3
Statewide	66,924	77,880	80,883	81,712	8,132	1
Geese (Late season)						
UP						
NLP	2,510	2,170	1,909	1,133	719	-41
SLP	17,663	22,395	23,049	19,179	4,430	-17
Statewide	20,174	24,566	24,957	20,312	4,532	-19
Geese (Seasons combined)						
UP	15,477	14,893	10,743	24,254	5,931	126*
NLP	47,877	61,827	65,314	53,169	8,104	-19
SLP	110,915	117,115	116,456	105,380	12,336	-10
Statewide	174,269	193,836	192,513	182,804	16,299	-5

^aRegions did not match hunting zones; see Tables 7 and 9 for estimates by hunting zones.

*Non-overlapping 95% confidence intervals indicated estimates differed significantly between 2006 and 2007 (P<0.005).

Table 7. Estimated number of duck hunters, hunting effort, and ducks harvested, summarized by season and management zone in Michigan, 2007.

Season and waterfowl zone ^a	Hunters		Effort		Harvest	
	No.	95% CL	No.	95% CL	No.	95% CL
First split						
North	5,693	618	37,380	5,962	46,624	9,974
Middle	10,533	816	58,510	7,056	64,388	9,387
South	27,020	1,121	198,792	13,758	238,855	23,162
Statewide	38,142*	1,153	294,681	16,055	349,868	26,955
Second split						
North	0	0	0	0	0	0
Middle	1,232	299	1,954*	499	3,396	1,241
South	8,567*	744	13,064*	1,227	20,799	2,918
Statewide	9,514*	782	15,018	1,409	24,195	3,302
Seasons combined						
North	5,699	618	37,399	5,962	46,677	9,974
Middle	10,796	825	60,474	7,231	67,801	9,894
South	28,304	1,131	211,825	14,268	259,585	24,281
Statewide	39,299*	1,151	309,699	16,548	374,062	28,171

^aEstimates for the zones do not equal estimates for the areas in Tables 4-6 because hunting effort and birds harvested from unknown locations were allocated among areas in proportion to the known effort and harvest.

*Non-overlapping 95% confidence intervals indicated estimates declined significantly between 2006 and 2007 (P<0.005).

Table 8. Estimated number of goose hunters, hunting effort, and geese harvested, summarized by season and management zone in Michigan, 2007.

Season and waterfowl zone ^a	Hunters		Effort		Harvest	
	No.	95% CL	No.	95% CL	No.	95% CL
Early						
North	2,390	385	9,058	1,884	8,947	2,533
Middle	3,515	467	15,916	2,651	12,872	2,938
South	16,040	914	63,778	4,802	58,960	6,431
Statewide	21,093	1,054	88,753	6,129	80,780	8,071
Regular						
North	4,096	501	30,697	5,728	18,133	4,052
Middle	4,980	551	24,436	4,000	13,629	3,068
South	17,829	946	88,545	7,322	49,949	5,870
Statewide	25,650	1,099	143,677	10,272	81,712	8,132
Late						
North	0	0	0	0	0	0
Middle	0	0	0	0	0	0
South	8,186	711	31,166	3,951	20,312	4,448
Statewide	8,166	731	31,166	4,194	20,312	4,532

^aEstimates for the zones do not equal estimates for the areas in Tables 4-6 because hunting effort and birds harvested from unknown locations were allocated among areas in proportion to the known effort and harvest.

Table 9. Estimated number of goose hunters, hunting effort, and geese harvested by season and management zone in Michigan, 2007.

Season and goose zone ^a	Hunters		Effort		Harvest	
	No.	95% CL	No.	95% CL	No.	95% CL
Early						
Upper Peninsula MVP ^b	2,248	385	8,512	1,884	8,382	2,533
Lower Peninsula MVP	9,508	759	39,872	4,199	34,024	5,292
Lower Peninsula SJBP ^c	10,362	784	40,369	3,907	38,374	5,113
Statewide	21,093	1,054	88,753	6,129	80,780	8,071
Regular						
Upper Peninsula MVP	3,874	501	29,279	5,728	17,111	4,052
Lower Peninsula MVP	11,573	821	57,662	6,049	32,469	4,952
Lower Peninsula SJBP	11,398	812	56,736	6,171	32,131	4,672
Statewide	25,650	1,099	143,677	10,272	81,712	8,132
Late						
Upper Peninsula MVP	0	0	0	0	0	0
Lower Peninsula MVP	3,363	478	13,979	2,876	10,205	3,904
Lower Peninsula SJBP	4,864	568	17,186	2,811	10,107	2,236
Statewide	8,166	731	31,166	4,194	20,312	4,532

^aEstimates for the zones do not equal estimates for the areas in Tables 4-6 because hunting effort and birds harvested from unknown locations were allocated among areas in proportion to the known effort and harvest.

^bMississippi Valley Population (MVP).

^cSouthern James Bay Population (SJBP).

Table 10. Level of satisfaction among waterfowl hunters with the 2006 and 2007 waterfowl hunting seasons and hunting regulations in Michigan (summarized as the proportion of active waterfowl hunters reporting various levels of satisfaction).^a

Hunting experience or regulation	Level of satisfaction and year															
	Very satisfied or somewhat satisfied						Somewhat dissatisfied or strongly dissatisfied						No answer			
	2006			2007			2006			2007			2006		2007	
	95%			95%			95%			95%			95%		95%	
	%	%	CL	%	%	CL	%	%	CL	%	%	CL	%	%	CL	
Ducks seen	48	46	2	21	19	2	31	34	2	1	1	0				
Ducks harvested	32	30	2	25	22	2	42	42	2	2	5*	1				
Duck hunting experience	57	57	2	19	21	2	22	20	2	2	2	1				
Duck season dates	49	46	2	26	28	2	23	23	2	3	4	1				
Length of duck season	53	52	2	25	27	2	20	17	2	2	3*	1				
Daily duck limit	56	58	2	29	28	2	13	11	1	2	3*	1				
Geese seen	62	61	2	17	15	2	20	21	2	2	3	1				
Geese harvested	37	36	2	21	19	2	40	38	2	2	7*	1				
Goose hunting experience	55	54	2	22	21	2	21	22	2	3	3	1				

^aEstimates associated with duck hunting were derived from answers provided by people that had hunted ducks, while estimates associated with goose hunting were derived from answers received from people that had hunted geese.

*Non-overlapping 95% confidence intervals indicated estimates differed significantly between 2006 and 2007 ($P < 0.005$).

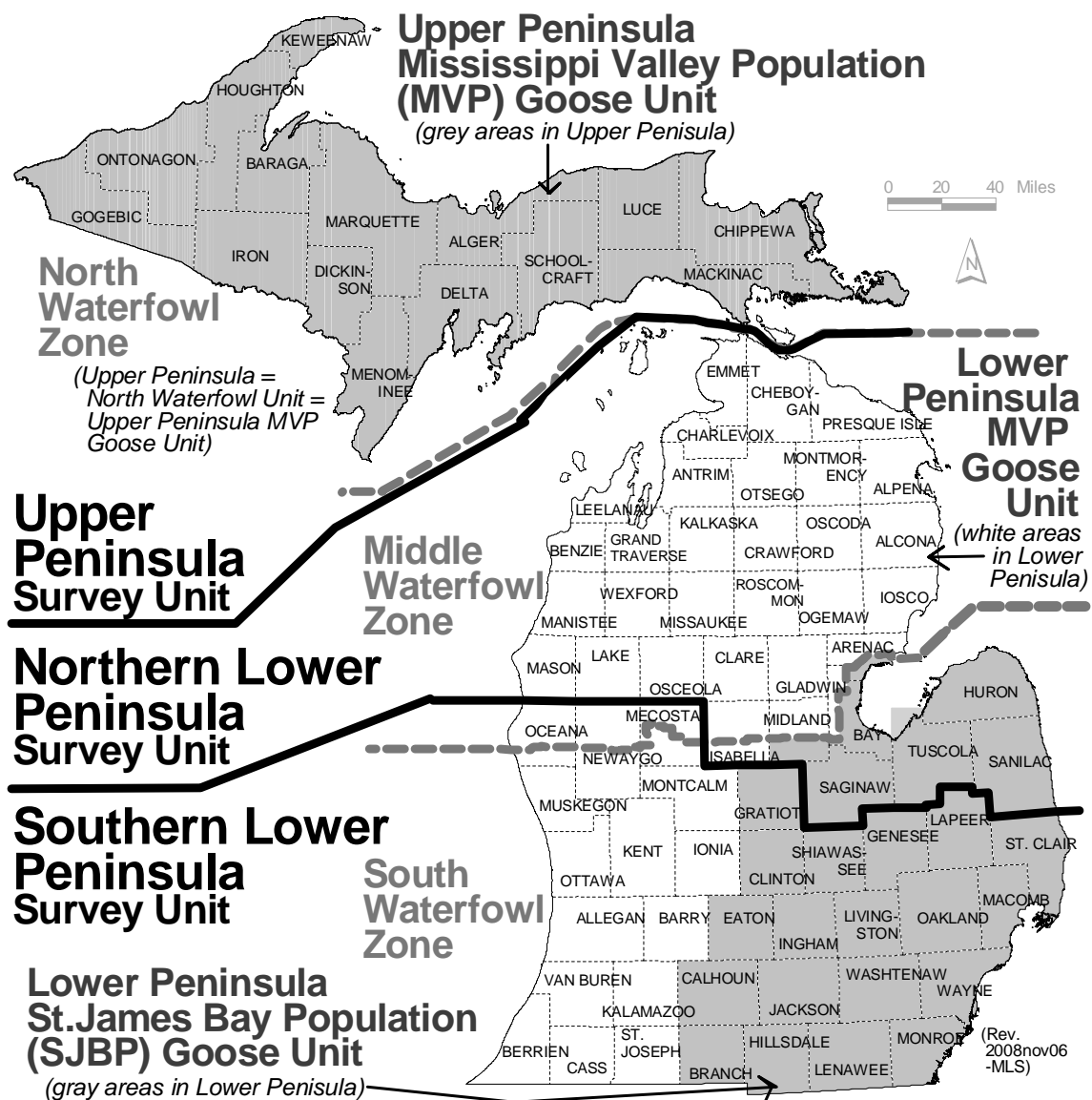


Figure 1. Areas used to summarize the waterfowl survey data for the 2007 waterfowl hunting seasons in Michigan. Regional boundaries did not match the waterfowl management hunting zones.

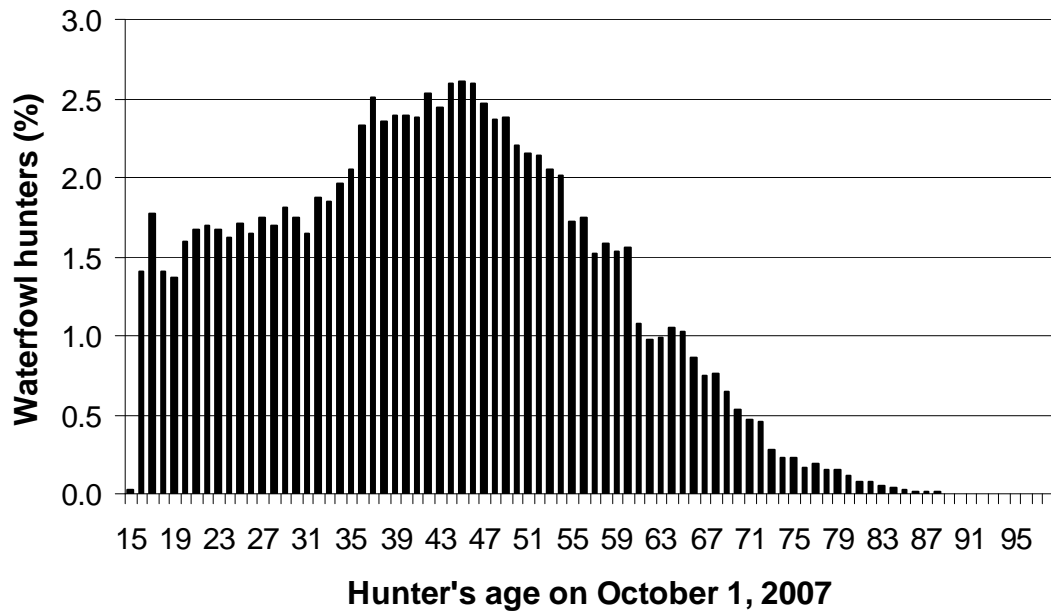


Figure 2. Age of people that purchased a waterfowl hunting license in Michigan for the 2007 hunting seasons ($\bar{x} = 42$ years). Hunters 10-15 years of age could legally hunt waterfowl without a waterfowl hunting license.

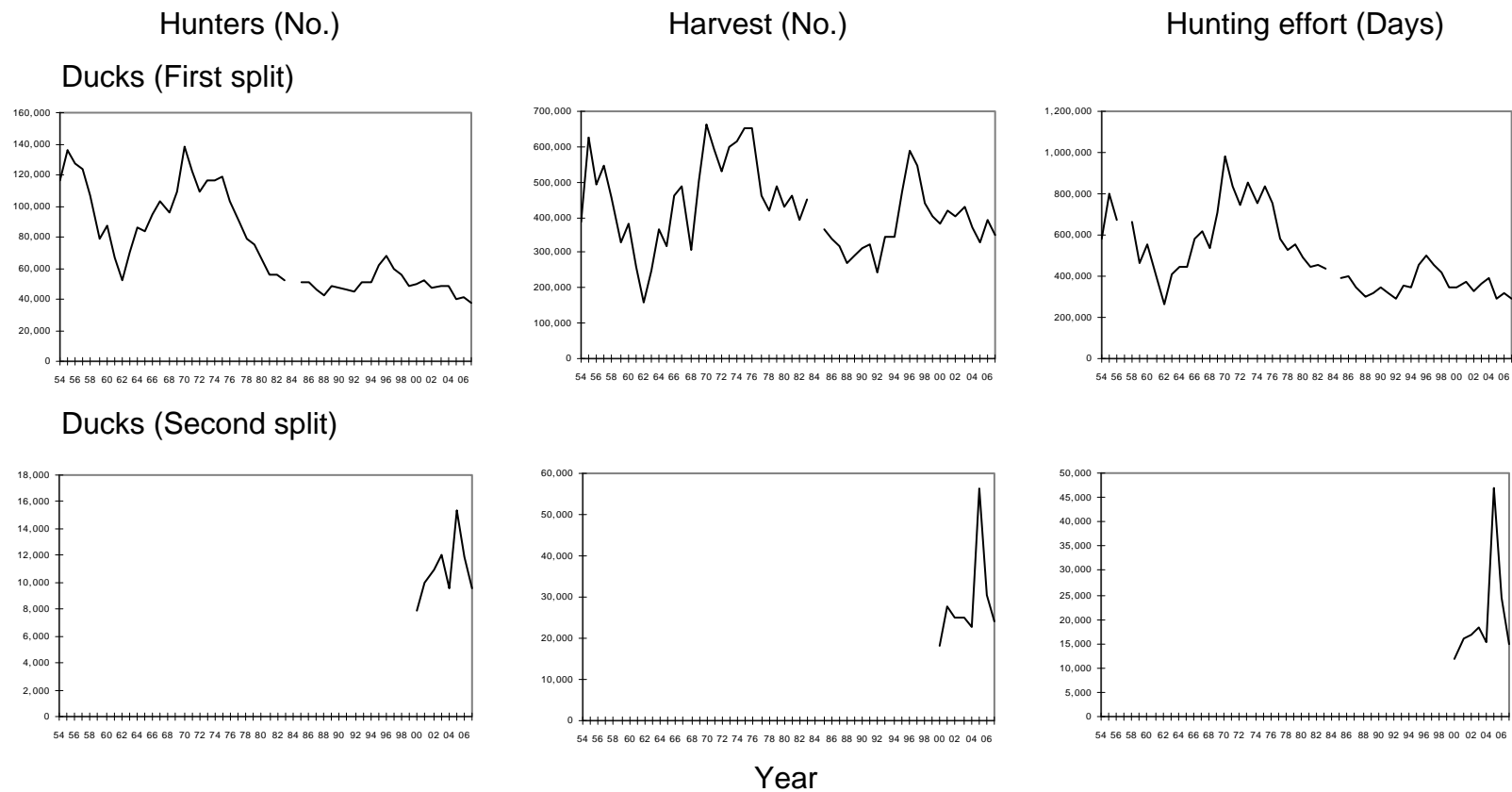


Figure 3. Estimated number of hunters, harvest, and hunting effort in Michigan during the waterfowl hunting seasons, 1954-2007. No estimates were available or no seasons existed during years when no data are plotted.

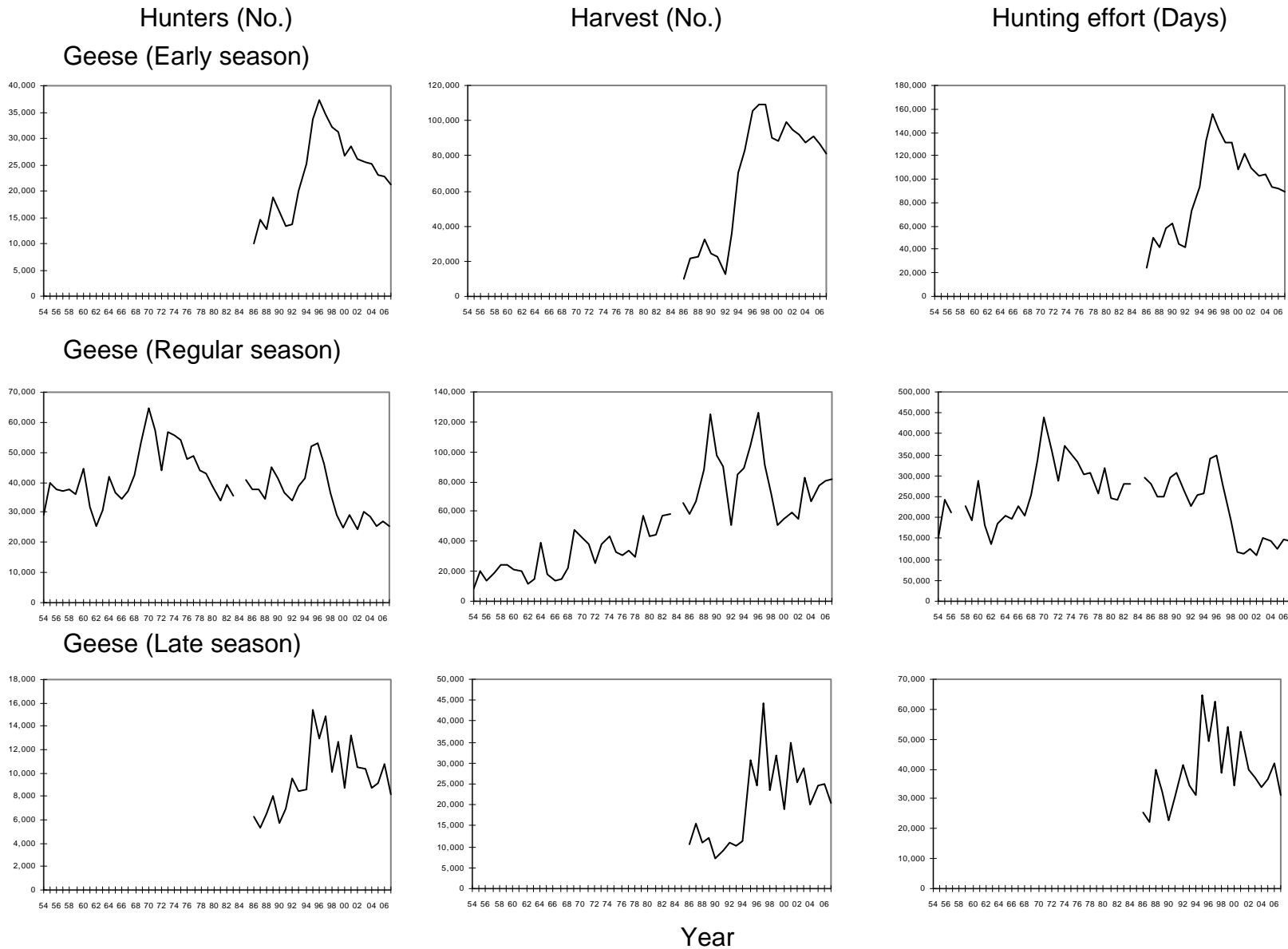


Figure 3 (continued). Estimated number of hunters, harvest, and hunting effort in Michigan during the waterfowl hunting seasons, 1954-2007. No estimates were available or no seasons existed during years when no data are plotted.

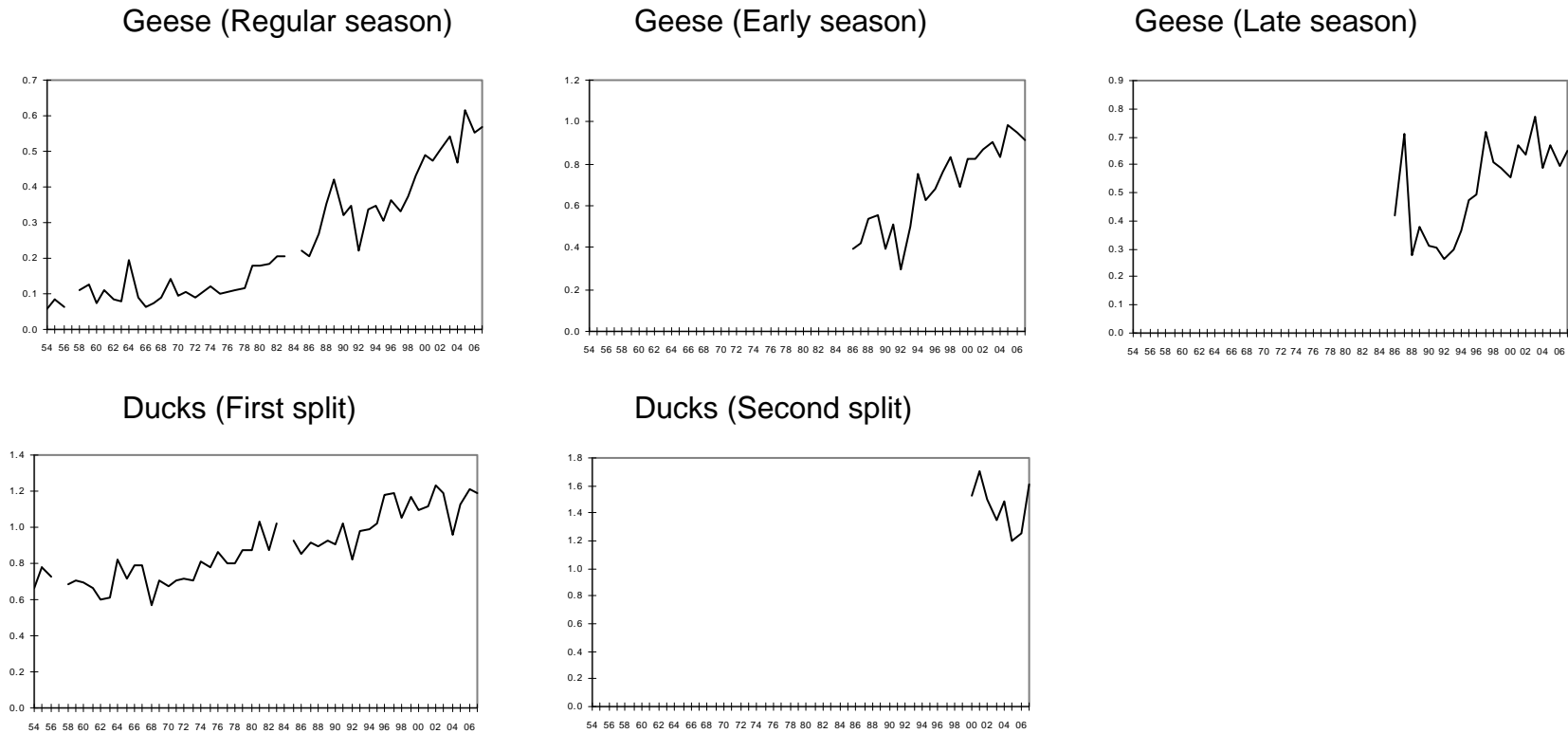


Figure 4. Estimated harvest per effort in Michigan during the waterfowl hunting seasons, 1954-2007. No estimates were available or no seasons existed during years when no data are plotted.